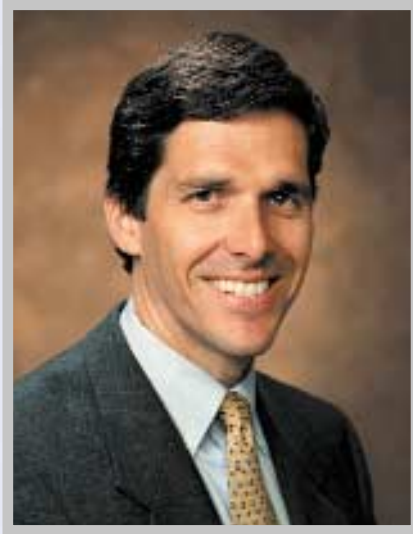


# **Main Streets: Flexibility in Design and Operations**



July 2002



This booklet emphasizes Caltrans' commitment to the production of transportation projects that make state highways that happen to be local main streets more walkable and livable. It is a manifestation of a trend that is sweeping rapidly across America – and across California: Context Sensitive Solutions.

Caltrans recognizes the potential benefits of measures such as reducing the number of lanes in a downtown, reducing lane widths, installation of traffic calming devices, lowered

speed limits, angled parking, wider sidewalks, roundabouts, raised medians and a number of other street side amenities that provide a feeling that a town's main street is where you would want to be.

None of these measures represent a reduction of the Caltrans commitment to safety or mobility; all are within the parameters of the Caltrans Design and Project Development Procedures manuals. Caltrans will continue to require appropriate justification for exceptions to design standards.

Caltrans remains committed to the notion that people live, work and play in the communities through which our facilities pass. It is our duty, by recognizing the needs of both non-motorized and motorized modes of transportation, to assure that living space is a good space in which to live. We are committed to full cooperation with the citizens and elected officials of those communities to find transportation solutions that meet both our duty to protect the lives and mobility of travelers, as well as making main streets a good place to be.

A handwritten signature in blue ink that reads "Jeff Morales".

# Main Streets: Flexibility in Design and Operations

Main streets provide access to businesses, residential roads and other nearby properties and serve pedestrians, bicyclists, businesses and public transit, with traffic typically traveling at speeds of 30 to 50 km/hr. Usually flanked with parking, they also accommodate public utility facilities within the right of way. They may be regional, primarily serving adjacent communities or even intrastate or interstate travelers, or they may serve mostly local needs.

The California Department of Transportation (Caltrans) has adopted a number of policies that encourage designers to respond to community values where state highways serve as main streets. Caltrans is committed to communicating opportunities for accommodating a community's values when discussing the design of projects on main streets with community stakeholders.

This summary identifies concepts that may be compatible with community values while assuring safe and efficient operations for vehicles, pedestrians, bicyclists and highway workers.

These guidelines are not intended to supersede the Caltrans Transportation Planning Manual, Project Development Procedures Manual, Highway Design Manual, Traffic Manual, or other established manuals, procedures or practices. These guidelines are not a set of standards, but are guidance and are to be used to complement established design practices, policies and standards. Deviations from Caltrans policy or standards to meet community requests will require an engineering analysis and, when appropriate, an approved Design Exception Fact Sheet for nonstandard features.<sup>1</sup>

## Partnerships – Funding and Responsibilities

Successful implementation of livable community and Context Sensitive Solutions (CSS) depends on a commitment to the principles of partnership. Although each partner has different roles and responsibilities, the community and Caltrans must commit to working together to develop the best solutions.



# community involvement

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For further information on who to contact as well as funding options, please contact the local Caltrans District Office or the Regional Transportation Planning Agency (RTPA).<sup>2</sup>

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Partnerships are expressed through collaborative transportation problem definition, shared decision-making and a mutual commitment to implementation. Each stakeholder can invest in the partnership with an expectation of receiving a return on that investment.

Caltrans recognizes that the construction and operating costs associated with the implementation of the livable community and CSS principles is a shared responsibility. The degree of financial contribution is a negotiated process based on roles and responsibilities of each stakeholder.

Early in the planning process, stakeholders should determine their financial commitment for the various elements proposed as part of the highway improvement. Additionally, stakeholders should agree to their role in the maintenance of the main street.

For further information on who to contact as well as funding options, please contact the local Caltrans District Office or the Regional Transportation Planning Agency (RTPA).<sup>2</sup>

## Performance Measures

Community support for a project is always important, particularly when implementing design concepts such as those discussed here. Caltrans considers community involvement a vital part of early project planning and requires full engagement with members of a community who express interest in implementing its vision. The level of community support for a project is usually apparent in the planning and project development process. Local funding of elements of construction and maintenance or a commitment to implementing measures such as improvements to parallel city streets or access management along the main street is a clear indication of community support.

For state highway main street projects, factors that help determine compatibility with community values include:

- Operating speeds and Level Of Service (LOS)<sup>3</sup>
- Congestion levels and reduction of motorist delay



- Improved pedestrian access and mobility
- Effect on school and business access
- Collision Data – before and after assessment
- Improved bicycle accessibility and mobility
- Effect on access to adjacent businesses

The following pages describe measures that can be used in project design to enhance sensitivity to its community context.

## Reducing the Number of Lanes

Reducing the number of lanes can provide space for features such as wider shoulders, bicycle lanes, wider sidewalks, medians, left turn lanes or parking. Reducing the number of lanes may decrease speeds, smooth traffic flow, and may reduce the potential for collisions. However, reducing



the number of lanes may also reduce the facilities' level of service.

This strategy is normally considered as a highway transitions from rural to downtown conditions. The main street will typically have an Average Daily Traffic (ADT)<sup>3</sup> fewer than 10,000 with approaching and departing two-lane segments and a four-lane facility through town. Consideration should be given to mobility impacts, congestion, collisions, pedestrians, bicyclists, as well as adjacent land uses such as schools, parks, libraries, homes and businesses. The District will coordinate with Headquarters Traffic Operations and Design, and should be consulted early in this process.

## Reducing Lane Width

Lane width plays an important role for both motorized and non-motorized users. Wider lanes tend to improve driver comfort. The physical dimensions of cars, recreational vehicles, trucks and buses, the type of highway and prevailing speeds, all influence the selection of the appropriate lane width. For highways that serve as

# *design elements*

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For highways that serve as main streets, particularly those that operate at lower speeds, lane widths narrower than 3.6 m may be appropriate. Reduced lane widths tend to encourage slower speeds, which is desirable for a main street.

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main streets, particularly those that operate at lower speeds, lane widths narrower than 3.6 m may be appropriate. Reduced lane widths tend to encourage slower speeds, which is desirable for a main street. Where existing right of way is limited, reducing lane widths can provide adequate shoulder for bike lanes and wider sidewalks. When considering use of narrower lane widths, the designer should recognize that the narrower lane reduces vehicle separation. A standard outside lane width is preferred where there is significant recreational vehicle and truck traffic or the main street is a designated bus route. The gutter is not considered part of the traveled way.

Reduced lane widths are to be approved for use on a case-by-case basis and, in accordance with the current procedure for exceptions to mandatory design standards, a design exception will be required for all cases where lane width is below the minimum standard.

## **Traffic Calming**

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### **Transverse Rumble Strips**

Transverse Rumble Strips (TRS) are to be used selectively on approaches to a main street where a speed reduction is desired and where speed limit signs are installed. On a state highway, a speed reduction will typically occur in a transition from rural to downtown conditions. The designer should consider a TRS that is compatible with motorcycle and bicycle use.<sup>4</sup> TRS will increase noise for the surrounding areas. Additionally, drainage should be considered, as a TRS might pond water that could result in an ice patch in snow areas.

Speed bumps or humps are not approved for use on state highways and are appropriate only for residential, non-state highway use. There is a safety concern for vehicles at higher speeds and drivers may swerve toward the shoulder to avoid them, decreasing safety for pedestrians and bicycles and other non-motorized modes of transportation. Many vehicles (especially emergency services vehicles) will detour to other streets to

avoid them, which simply shifts traffic to other routes and slows emergency vehicle response times. Speed bumps also increase noise for the surrounding area.

### Visual Cues

Visual cues help drivers recognize that they are entering an area of increased pedestrian and bicycle activity. Examples of visual cues that can reinforce this transition include:

- “Gateway” treatments: typically, signs or monuments see *“Gateway Monuments Section”*
- Sidewalks: typically accompanied by curb and gutter to designate portions of the roadway for motorized and non-motorized users



- Raised medians or traffic islands: typically installed as an access management technique – provide a pedestrian refuge area or accommodate landscaping
- Landscaping
- Ornamental lighting, planters, flags, benches, trash receptacles, light poles, traffic signals, overhead banners, artwork, bus shelters and other street furniture
- Pedestrian signs
- Textured intersection pavement

**NOTE:** All design elements that can be classified as fixed objects shall be located beyond the minimum horizontal clearance distance<sup>5</sup> or outside the clear recovery zone,<sup>6</sup> whichever is appropriate. Note that horizontal clearance varies, depending on whether or not the fixed object is adjacent to the sidewalk or the curb in the median.





# *safer solutions*

## Synchronized Signals

A series of synchronized traffic signals can maintain the Level of Service and facilitate traffic flow at a given speed.

- Roundabouts: in the appropriate location can reduce the number and severity of collisions, improve traffic circulation and delay and reduce the speed of through traffic (especially when installed at a series of intersections). Additional information on roundabouts can be found in Caltrans Design Information Bulletin (DIB) 80<sup>7</sup> and FHWA publications<sup>8</sup> and is available electronically on the Internet homepages of each organization.



## Lower Speed Limit

Caltrans recognizes that many communities would like to reduce the speed limit on their highway segments that serve as a main

street. Lacking an Engineering and Traffic Survey (ETS)<sup>9</sup> that supports a lower speed limit, the speed reduction can more appropriately be achieved by creating a transition area using design elements that will naturally reduce the speed of the motorist.

Changing the speed limit on a state highway that serves as a main street requires an ETS, consultation with and consideration of recommendations of the California Highway Patrol and/or local police department, and an opportunity for a public hearing (typically sponsored by the local city council or board of supervisors of a city or county through which the state highway passes).

If a speed limit is not established in accordance with California Vehicle Code (CVC),<sup>10</sup> such limits will not be enforced by radar.

If changes are made to a section of the highway that might lead to a speed limit reduction (for example, a roundabout), the Deputy District Director of Operations can recommend that the speed limit be reduced. In this case, Caltrans can place speed limit reduction signage in these





areas as an interim solution with the understanding that the interim speed zone cannot be enforced with radar. Thereafter, an ETS must be completed within six months and the signage must comply with the ETS. Headquarters Traffic Operations staff should be consulted early in this process; any changes should be approved by the District Director.

## Parking

On-street parking may have a traffic calming impact. While parking is necessary to support business and main street uses, parked vehicles cannot be allowed to obstruct a driver's clear line of sight to an intersection. This is especially important for bicyclists traveling on the outermost portion of a roadway and pedestrians or disabled persons who may not be tall enough to be seen above a parked vehicle. Some communities have expressed interest in angled parking to accommodate more parking spaces on the main street. Angled parking can be forward (nose-in) or reverse (back-in). However, it can create problems due to the varying

length of vehicles and sight distance limitations associated with backing up against oncoming traffic.<sup>11</sup>

Angled parking is most feasible when an adequate buffer zone exists that allows vehicles to enter or exit the space without interfering with a bicycle lane<sup>12</sup> or, if there is no bicycle lane, the traveled way of the main street. A painted island is preferred, to separate the buffer area from the through traffic and bicycle lane. If a sufficient buffer area is not available, parallel parking should be used.

## Sidewalks

For most communities, the preferred sidewalk width in a downtown environment is 3.0 m. This width allows pairs of pedestrians to walk side by side or to pass comfortably. More width is desirable to accommodate high volumes of pedestrians, bus shelters, sidewalk cafes<sup>13</sup> and other outdoor users. In general, the wider the sidewalk, the more pleasant the pedestrian experience. Other requirements for sidewalk design are

# *pedestrian crossings*

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... when a sidewalk is designated for bicycle use, it is important to recognize that an extremely wide sidewalk does not necessarily add to the safety of all users.

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outlined in the Highway Design Manual (HDM) Topic 105 Pedestrian Facilities. All sidewalks shall be subject to the requirements of the Americans with Disabilities Act of 1990.<sup>14</sup>

In general, the use of sidewalks for bicycle travel is not desirable due to conflicts between pedestrians and bicyclists. However, when a sidewalk is designated for bicycle use, it is important to recognize that an extremely wide sidewalk does not necessarily add to the safety of all users. Wide sidewalks encourage higher bicycle speeds and can increase potential for conflicts with motor vehicles at intersections as well as with pedestrians and fixed objects. Also, wider sidewalks may draw other users, including skateboarders, push scooters and in-line skaters. Refer to the Highway Design Manual Index 1003.3 for more information on designating the use of sidewalks for bicycle travel.

On-street parallel parking and landscaped sidewalk planting strips can provide a buffer between pedestrians and moving vehicles.

## Crosswalks

### General

The principles and practices described in this section apply to pedestrian crossings. However, they also may apply to other types of non-motorized crossings, such as equestrian, bicycles, etc. This section does not apply to school crosswalks.<sup>15</sup>



- Intersections: Pedestrian crosswalk markings may be installed where they are needed to channelize pedestrians into a preferred path at intersections when the intended course is not readily apparent or when, in the opinion of

the engineer, their presence would minimize pedestrian-auto conflicts. Pedestrian crosswalk markings should not be used indiscriminately.

Pedestrian crosswalk markings may be placed at intersections, representing extensions of the sidewalk lines, or on any portion of the roadway distinctly indicated for a pedestrian crossing.

- **Mid-Block:** Mid-block pedestrian crossings are generally unexpected by motorists and should be discouraged unless, in the opinion of the engineer, there is clear and reasonable justification. Particular care should be given to roadways with two or more traffic lanes in one direction; a pedestrian may be hidden from view by a vehicle yielding the right-of-way to the pedestrian.



- **Brick Pavers and Stamped Concrete in Crosswalks:** In general, stamped concrete and asphalt concrete are preferred over brick or unit pavers when a textured/aesthetic surface treatment is desired. Either must meet the criteria specified in the Caltrans Traffic Manual for crosswalks. Brick or unit pavers should be discouraged because of potential problems related to pedestrians, bicycles and ADA requirements for a continuous, smooth, vibration-free surface. Other issues related to brick or unit pavers are noise, initial cost, and uniformity and, in particular, the potential high cost of maintenance. Installation and maintenance of brick pavers requires skilled labor, storage of replacement materials, extended traffic control,





# *higher visibility*

worker exposure, and may result in public inconvenience. Any textured or aesthetic crosswalk surface treatment must also have painted crosswalk markings.

The use of textured surface treatments for crosswalks may be considered for approval from Headquarters Traffic on a case-by-case basis.

Traffic Operations should be consulted early in project scoping. It is important that the design engineer ensure that the project is in compliance with accessibility requirements<sup>16</sup> and that the proposed textured/aesthetic surface treatment meets structural section requirements as specified by the District Materials Engineer.

- In-Pavement Flashing Lights:<sup>17</sup> In California, crosswalk-warning systems are considered traffic control devices. They can be installed in the roadway surface to warn highway users

of a condition that is not readily apparent and may require the road user to slow or come to a stop.<sup>18</sup> Such systems should be considered for use on a state highway only after consultation with the Headquarters Traffic Operations Liaison.<sup>19</sup>



- Sidewalk Bulbouts (Curb Extensions): Sidewalk bulbouts are extensions of the sidewalk into the roadway at intersections. They are designed to give pedestrians greater visibility as they approach the intersection crossing, decrease the distance they





must cross and slow traffic. They often have textured/aesthetic surface treatment and are integrated into the streetscape design.

Sidewalk bulbouts are to be approved for use on a case-by-case basis if they do not meet design standards. A design exception will be required for all cases where a bulbout reduces shoulder width below the minimum standard. Where a bicycle lane exists or is planned in the future, the bulbout shall be designed so as not to extend into the area reserved for the bike lane. It must provide the proper turn radius so that trucks can turn without driving over the curb. It must allow for adequate drainage to avoid ice, leaf and road debris buildup and to allow street sweeper accessibility. In areas

of regular snowfall, curb extensions must be marked with objects visible to plow operators.

## Street Lighting

Main streets should have adequate lighting for pedestrians to feel secure at night. Decorative lighting fixtures are occasionally requested by local communities to enhance a downtown's unique sense of place. Decorative lighting or traffic signal fixtures may be used provided they meet current federal and state safety standards. Poles and signal controller boxes must be placed well out of the pedestrian area of the sidewalk. Poles in the median, within the clear recovery zone, must have breakaway bases.

## Furnishings

(Benches, Kiosks, Bollards, Bike racks, Outdoor patio furniture, etc.)

Street furniture provides pedestrians a place to rest and socialize. To enhance pedestrian activity, a main street may include places to sit, such as benches, low walls, planter







edges or wide steps. The presence of pedestrian gatherings reminds motorists that streets have other public uses. Furniture layouts for sidewalks must place these objects away from the pedestrian path. Tables for dining are not appropriate except under a special event permit.

Bike racks and bollards should be placed outside the clear recovery zone and away from the pedestrian area of the sidewalk. Bollards must be tall enough so they do not create a tripping hazard to pedestrians.



## Street Landscaping

### General

Street landscaping is often requested to make downtowns more livable, more beautiful and unique to the town, or to increase comfort and safety for pedestrians. Quality

landscaping that is close to the highway or in medians can increase driver awareness of the immediate environment and alter driver behavior, resulting in slower speeds and a safer main street.

If appropriate maintenance agreements are in place, street landscape, consisting of low-growth plants, is generally acceptable if its maintenance does not create safety concerns on the state highway.

Trees can add an attractive canopy over the main street. They create comfortable spaces and soften lighting. They cool streets in the summer, block wind in the winter and absorb pollutants. They also provide a main street with a distinctive identity and seasonal interest. Although a row of trees doesn't actually impede drivers, it may calm traffic by making the road appear narrower.

Trees improperly located along the state highway may create problems by blocking visibility for turns into and from intersections and driveways. They may block visibility of stop signs or other roadside signs and



# *beautification*

decrease visibility for pedestrians at intersections. Along landscaped park strips, a row of trees may obstruct a driver's line of sight to oncoming traffic. For these reasons, any new tree plantings must ensure that clear sight lines are maintained for drivers, bicyclists and pedestrians. Plantings must also conform to the Caltrans minimum for a clear recovery zone.<sup>20</sup>

Trees must not impair corner sight distance or present a barrier for highway users such as pedestrians and bicyclists. Caltrans District Landscape Architecture should review any proposed plantings and recommend appropriate installations so that root growth does not damage adjacent drainage, utilities, pavement or sidewalks. Leaves from deciduous trees can clog drainage inlets and lead to street flooding. Evergreen trees are preferred in areas that may be susceptible to drainage problems.

- **Raised Median (Landscaped) Islands:** Communities often request landscaped islands for several reasons: they provide pedestrian refuge, reduce the scale of

the main street, make the public space more beautiful, channelize left turns and create a unique visual identity to the corridor. Raised islands reduce conflicts between pedestrians and vehicles by allowing pedestrians to cross only one direction of traffic at a time. Wide islands should be designed to provide refuge for pedestrians crossing the street at intersections and designated mid-block crosswalks.



A raised median island will divert all through traffic from side streets and all

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Caltrans District  
Landscape  
Architecture  
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utilities, pavement  
or sidewalks.

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left turn movements to the nearest signal or intersection where U-turns are permitted. Designers must conduct proper analysis to ensure that these intersections can handle the added turning

movements. Adequate left turn pockets will be needed to provide storage space for the additional vehicles making the left turns and U-turns. Circulation from the side streets may be affected, which could impact local businesses and neighborhoods.

Fixed objects in the islands such as trees, boulders, bollards, sign posts, and light poles must be set back from the islands' curb faces (see Encroachment Permits Manual, Section 505.7.) or made breakaway. Where the island width is insufficient to accommodate these, other design considerations may include eliminating lanes, using vertical curbs, or planting large multi-stemmed shrubs rather than

trees. A Landscape Architect should be consulted about these types of plants. Landscaping within the raised island should not restrict sight distance.<sup>21</sup> The District Traffic Liaison must approve pedestrian crossings and end treatments that use high barriers or vertical curbs as a planter.

Access for maintenance workers and their equipment should be considered in the design of islands and in the selection of paved surface treatments, plant materials and irrigation systems. Maintenance-efficient curb island design, which may include using water-efficient plantings, is encouraged. Additionally, paving narrow areas less than 1.2 m and areas within 50 m of the end of a left-hand turn pocket at an intersection lessens maintenance personnel exposure and minimizes obstructions that may impair sight distance.

Areas that receive regular snowfall require careful evaluation and may not be good candidates for islands due to snow removal considerations.

# efficiency

A shoulder of at least 0.6 m shall be provided from the left edge of traveled way (ETW) to the face of the island curb. The ETW should be delineated with a yellow stripe.

The nose of the island shall terminate so that vehicles can easily complete turning movements without obstruction.

## Banners and Decorations<sup>22</sup>

Caltrans District Permit Offices review requests and authorize permits for the erection of banners, decorations and temporary signing for events by local agencies and nonprofit organizations over and within state right-of-way. For specific minimum horizontal and vertical clearance requirements, refer to the Encroachments Permit Manual.<sup>23</sup>

Authorized banners and decorations over the roadway must have a minimum vertical clearance and be suspended securely from permanent structures or poles. No temporary supports are allowed and the use of state facilities is prohibited.

Permanent overhead signs or arches may not be erected or suspended over any state highway. Banners are not authorized on controlled access rights-of-way.

- Non-Decorative Banners: are intended to convey a message such as the occasion of an event or activity. Caltrans issues permits for non-decorative banners to local agencies or nonprofit organizations sponsoring an event the local agency has approved. Banners displaying private advertisements are not allowed except when used as part of an event's official title (e.g. Kellogg's Napa Valley Marathon).

Districts may issue biennial permits to local agencies for installation of non-decorative banners for recurring events. The local agency then authorizes each banner installation,





# *artistic values*

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## Decorative Banners:

are intended to convey brief text or logos identifying the local agency.

Decorative banner permits may be issued to a local agency for enhancement of its main street.

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notifies the state's representative and provides traffic control.

- Decorative Banners: are intended to convey brief text or logos identifying the local agency. Decorative banner permits may be issued to a local agency for enhancement of its main street. As a minimum, decorative banners shall:

1. Be used exclusively on conventional state highways
2. Not contain advertising whether in text or logo format.
3. Remain in place for periods up to two years – the normal biennial permit duration.
4. Be applied for by the local agency.

- Decorations: those that project beyond the curb line or cross the highway shall have a minimum vertical clearance above the highway pavement. Decorations attached to vertical structure such as power, telephone, light poles, or building

are not to project beyond the curb line and have a minimum vertical clearance above the sidewalk.

Decorative red, yellow or green lights or decorations that may be confused with any traffic control device shall not be placed where they could interfere with the driver's perception of traffic signals.

Holiday decorations are permitted on conventional state highways. See requirements above and the encroachment permit manual for additional requirements.

## Gateway Monuments<sup>24</sup>

A gateway monument is a freestanding object that communicates the name of a community or jurisdictional authority and provides a favorable image that does not distract travelers. Guidelines for Gateway Monuments will be released early in 2003, and will contain additional information.

### Transportation Art<sup>25</sup>

Transportation art is defined as authorized artwork created, constructed, or painted on structures or other facilities or spaces within the transportation right-of-way.

The state has an interest in encouraging aesthetic considerations in the design of all transportation facilities and services. Caltrans recognizes that well-conceived art forms, properly located, can enhance the experiences of those using transportation facilities and enrich the environment of neighboring communities.

Local communities often desire to express attitudes and feelings visually about their physical environment, ethnic values and cultural heritage. It is Caltrans' intent, by means of its Transportation Art Program, to encourage others to use its facilities, structures and right-of-way spaces for creative expression through the visual arts.

Caltrans encourages and promotes enrichment of the cultural and visual environment for motorists and local communities by

facilitating and coordinating the placement of artwork by others within transportation right-of-way. Placement of such artwork is conditional on appropriate maintenance agreements and assurance that its maintenance does not create safety concerns on the state highway.



## Notes



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# Footnotes

- 1 See Highway Design Manual Topic 80
- 2 Contact the local District Office or visit Caltrans website at <http://www.dot.ca.gov/localoffice.htm>
- 3 For a complete definition of Level of Service (LOS) and Average Daily Traffic (ADT), see Traffic Manual, Section 1-04
- 4 For further information on Transverse Rumble Strips (TRS), please refer to the Caltrans Traffic Operations report, accessible on the Traffic Operations website: "Evaluation of Milled-in Rumble Strips, Rolled in Rumble Strips and Proprietary Applications" dated February 2001
- 5 See Highway Design Manual Topic 309.1(3) (c)
- 6 See Highway Design Manual Topic 309.1(2)
- 7 For more information, see Design Information Bulletin (DIB) 80
- 8 FHWA "Roundabouts: An Informational Guide" (June 2000) and other Roundabout guidance are available on FHWA's website at <http://www.tfhr.gov/safety/00068.htm>
- 9 See Traffic Manual, Section 8-03
- 10 See California Vehicle Code (CVC) section 22354 and 22354.5 Visit Department of Motor Vehicle's website at <http://www.dmv.ca.gov/pubs/vctop/vc/tocd11c7a1.htm>
- 11 See Traffic Manual, Section 8-2.02
- 12 See Highway Design Manual, Chapter 1000 – Figure 1003.2A for bike lane and parking configurations
- 13 Check with the District Encroachment Office for Permit Requirements
- 14 American Disabilities Act Title 28 of the Code of Federal Regulations (CFR) Part 35, all pedestrian facilities constructed must meet accessibility requirements
- 15 See Chapter 10 in the Traffic Manual for school crosswalk warrants
- 16 For more information, see Design Information Bulletin 82, "Pedestrian Accessibility Guidelines for Highway Projects"
- 17 For additional information, see Chapter 4.L. "In-Roadway lights" of the Manual on Uniform Traffic Control Devices, Millennium Edition – visit website at <http://mutcd.fhwa.dot.gov/>
- 18 For additional information, see North Carolina Highway Safety Research Center Report on In-Pavement Flashing Lights Crosswalk Warning System, April 1998. You may access this document at the W-Trans website at <http://www.w-trans.com/xwk.htm>
- 19 For the appropriate Headquarters Traffic Operations Liaisons, contact the District Traffic Office
- 20 See Highway Design Manual Topic 309.1(2)
- 21 See Highway Design Manual, Topic 902.2(2)
- 22 Encroachment Permits Manual, Section 500, Banners
- 23 Encroachment Permits Manual, Section 501.7, Banners and Decorations
- 24 Encroachment Permits Manual, Section 500, Gateway Monuments soon to be addressed
- 25 For additional information see Chapter 29 Section 6 of the Project Development Procedures Manual

## For Internet Access visit Caltrans' website...

Design Information Bulletins, Highway Design Manual,  
or Project Development Procedures Manual:

<http://www.dot.ca.gov/hq/oppd/guidance.htm>

Encroachment Permits Manual:

[http://www.dot.ca.gov/hq/traffops/developserv/permits/encroachment\\_permits\\_manual/index.html](http://www.dot.ca.gov/hq/traffops/developserv/permits/encroachment_permits_manual/index.html)

Traffic Manual:

<http://www.dot.ca.gov/hq/traffops/signtech/signdel/>

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